

# C ontents

<b>Executive Summary</b>	<b>E-1</b>
<b>Introduction</b>	<b>I-1</b>
Purpose	I-1
Document Organization	I-1
PAMS Brief Description	I-2
Why PAMS?	I-2
Regulatory Requirements	I-2
Status	I-3
Further Information	I-4
Comments	I-4
Request for Additional Copies	I-5
<b>Chapter 1: Characterization of Ambient Air Quality for Ozone and Its Precursors</b>	<b>1-1</b>
Introduction	1-1
Episode Characterization Using Meteorological Measurements	1-1
<i>Characterizing Episode "Severity"</i>	1-1
<i>Determining Source/Receptor Orientations Corresponding to Ozone</i>	
<i>Conducive Conditions</i>	1-2
<i>Identifying Critical Circulations Associated with High Ozone Events</i>	1-2
<i>Identifying Boundary Layer Structures Associated with High Ozone</i>	
<i>Events</i>	1-3
Episode Characterization Using Air Quality Measurements	1-3
<i>Indicators of Ozone Episodes</i>	1-4
<i>Distinguishing Among Episode Types</i>	1-4
<i>Characterizing Precursor Species During Episodes</i>	1-4
<i>Assessing Air Mass Aging Using PAMS Precursor Data</i>	1-5
<i>Temporal Variation in PAMS Precursor Data</i>	1-6
<i>Statistical Models of Relationships between Ozone and Precursors</i>	1-8
References	1-13

<b>Chapter 2: PAMS Data in Support of Ozone Modeling Applications</b>	<b>2-1</b>
Introduction	2-1
Model Overview	2-1
Model Evaluation Using PAMS Data	2-3
<i>Example: Los Angeles, CA</i>	2-3
<i>Example: Houston Ship Channel</i>	2-3
Development and Testing of Model Inputs	2-4
<i>Episode Selection and Domain Specification</i>	2-4
<i>Development of Meteorological Inputs and Meteorological Model Evaluation</i>	2-4
<i>Mixing Depth</i>	2-5
<i>Wind Fields</i>	2-6
<i>Additional Uses for PAMS Meteorological Data</i>	2-7
Development and Evaluation of Emissions Inputs	2-8
Discussion of AQSM Performance and Corresponding Uses of PAMS Air	
Quality Data	2-8
<i>PAMS and Compensating Errors</i>	2-9
<i>Suggested Uses of PAMS Data for Model Evaluation by Compound Class</i>	2-9
<i>Total NMOC and NMHC</i>	2-10
<i>Speciated VOC and Carbonyls (Isoprene and Formaldehyde)</i>	2-11
<i>Nitrogen: NO<sub>x</sub>(NO, NO<sub>2</sub>), NO<sub>y</sub></i>	2-12
 <b>Chapter 3: Evaluation of Emission Factors, Models and Inventories with PAMS</b>	
<b>Data</b>	<b>3-1</b>
Introduction	3-1
Background	3-1
<i>Potential Inventory Problems</i>	3-2
<i>Difficulties in Comparing Ambient Data and Emissions Estimates</i>	3-3
PAMS Results	3-4
<i>Examples of Indicator Species or Compounds (Tracers)</i>	3-5
<i>Examples Using NMOC/NO<sub>x</sub>, Directional and Time Series Analyses</i>	3-7
Example of Inventory Evaluation for Lake Michigan Inventory	3-9
Examples Using Multivariate Analyses and Chemical Mass Balance (CMB)	3-10
<i>Example of Inventory Evaluation in Atlanta</i>	3-11
<i>Example of Inventory Evaluation in Southern California</i>	3-11
Case Study-Example of Inventory Evaluation In Houston, Texas	3-12
Conclusions	3-14
References	3-14

## **Chapter 4: Observational Based Methods for Determining VOC/NO<sub>x</sub> Effectiveness 4-1**

Introduction	4-1
Empirical Techniques	4-1
<i>VOC/NO<sub>x</sub> Ratios</i>	4-1
<i>Reactive (Oxidized) Nitrogen (NO<sub>y</sub>, NO<sub>z</sub>) and Ozone Correlation Techniques</i>	4-3
Observational Models	4-3
<i>Smog Production Algorithm - MAPPER Program</i>	4-3
<i>GIT Model</i>	4-5

## **Chapter 5: Quality Assurance 5-1**

Introduction	5-1
Data Assessment	5-1
NPAP and Proficiency Studies	5-1
Precision and Accuracy Data	5-2
Data Validation	5-3
Summary Statistics and Historic Precedence (Scatter Plots)	5-4
Frequency Distributions	5-4
Spatial and Temporal Plots	5-5
Inter-Site Comparisons and Inter-Species Comparisons	5-5
References	5-6